

VII.—*Descriptive Notes on some obscure British Spiders, with Description of a new Species.* By the Rev. FREDERICK O. PICKARD-CAMBRIDGE.

[Plate II.]

OF the spiders described in the following pages one is new to science and another new to the British list. These species, belonging to two different genera, were both found in the Lake districts of Cumberland upon Mount Helvellyn, during a hasty ascent made by no means with a view to hard work amongst the spiders. There can be little doubt that the Lake districts, both vale and hill regions, will, when worked, produce a number of good things. The warm moist glens or chines, so noticeable a feature in the country round Carlisle and the hilly north-west of England, seem to be particularly suitable to the encouragement of spider-life; and, although other more important occupations have hitherto prevented any extended or diligent search in these localities, yet I feel convinced, judging from casual captures caught up at odd times and in odd places, that there is a considerable wealth of species to be "turned up" by a zealous arachnologist.

So far I am unable to make any comprehensive note upon the spider fauna of Cumberland with a view to a knowledge of the distribution of species; but the few data which have come to hand would indicate that many species rare in the extreme south are abundant in the north, noticeably *Amaurobius fenestralis*, Stroem, *Lycosa agricola*, Th., *Cryphæa silvicola*, Blackw., *Calotes atropos*, Walck., *Tmeticus scopiger*, Grube; but beyond this fact and the conjecture that we have up here a number of species which are peculiar to Alpine regions, it is impossible, with the very small amount of material yet gathered together, to draw any general conclusions as to climatic influences which may be of any service to the question of geographical distribution. One would be inclined to expect that many of the species apparently peculiar to the north would be found in the southern counties in localities whose physical characteristics are somewhat similar, *e. g.* in the hilly districts of the three extreme south-western counties and in Wales.

The opportunity has been taken in the following paper of including in a synoptic table diagnoses of those genera adopted by M. Simon in his classification of those species of the family Therididæ which fall under one of his subgroups Linyphini. It is not yet possible to say that the subdivision

of this difficult family is by any means quite satisfactory ; but the generic characters given may be of assistance to fellow students who may wish for a few good landmarks to guide them in the task of threading the intricacies of a distressingly involved group of spiders.

### Fam. Therididæ.

#### Group LINYPHINI.

This large group comprises all those numerous spiders described under the generic name *Linyphia*, Bl. & Cambr., as well as many under the names *Neriene*, Bl. & Cambr., *Micryphantes*, Menge, and other generic titles.

The spiders have as a rule long slender legs, clothed with more or less long stout spines. They construct a horizontal sheet-like web, in many cases having a maze of crossing and recrossing labyrinthine threads above it, upon bushes, amongst grass, in the foliage of trees, amongst rocks, in the corners of outhouses, &c., while many of the smaller members of the group merely weave a slight horizontal web beneath stones and over hoof-marks or slight depressions in the ground. One species, *Drapetisca socialis* (*Linyphia*, Bl. & Cambr.), is always found with its legs outstretched and its body lying flat on fir-tree trunks or smooth rocks.

Below will be found the most tangible characters by which the members of this group, as characterized by M. Simon in 'Les Arachnides de France,' may be recognized, and added to these will be found a brief summary of the characters which appear to be most easily observable, and therefore, it is hoped, the most practically useful, of those genera into which M. Simon has divided his group Linyphini.

#### LINYPHINI.

*Labium having a fold in the integument at the apex (having the margin reflexed or turned back upon itself). Tibiæ of the fourth pair of legs (usually of all the other legs as well) furnished with two erect spines or bristles on the upperside, one near the base, the other towards the apex.*

The following genera are all represented by one or more species to be found in Great Britain, and most of them seem to form good distinctive groups. *Taranucnus*, Sim., represented in our fauna by *Linyphia setosa*, Cambr., however, seems scarcely separable from *Leptyphantes*, while *Porhomma*,

Sim., *Hilaira*, Sim., and *Tmeticus*, Menge, Sim., run very close together.

The whole family Therididæ is still, as it were, a super-saturated solution of species, into which M. Simon, Mr. Emerton, and other arachnologists have flung their crystals, and around these are gradually gathering, like to his like, the better disposed species who will condescend to recognize a brother amid the motley heterogeneous assemblage. As to the others, we must be content for the present to leave them still in solution until a further boiling down shall concentrate the residue and render it possible to gather together its wayward atoms into something like decent scientific order.

*Genera.*

- A. Anterior row of eyes very strongly curved, its convexity directed forwards.
  - i. Legs not furnished with spines. Clypeus very low, slightly wider than the central anterior eyes. Central anteriors larger than the laterals ..... *Tapinopa*, Westr.
  - ii. Legs very spinose. Clypeus very high, equalling the width of the ocular area. Central anteriors smaller than the laterals ..... *Frontina*, Sim.
- B. Anterior row of eyes straight or almost so.
  - i. Basal joint of falces with two stout spines on the inner frontal margin of each ..... *Drapetisca*, Menge.
  - ii. Basal joint of falces without spines in front.
    - 1\*. Anterior metatarsi as long as tibiæ.
      - A. Eyes of posterior row widely separated, their intervals always greater than their diameter.
        - a. Anterior tarsi very long, at least two thirds the length of the metatarsi ..... *Bolyphantes*, Menge, Sim.
        - b. Anterior tarsi only half the length of the metatarsi (except *lineata*) ..... *Linyphia*, Latr.
      - B. Eyes of posterior row nearer together, their intervals smaller than their diameters.
        - i. Eyes of anterior row equal in size. Metatarsi armed with several spines .... *Labulla*, Sim.
        - ii. Eyes of anterior row unequal; centrals much smaller than laterals.

- A. Posterior row of eyes strongly curved, its convexity directed forwards. Femora of all four pair of legs armed with at least one spine on the upperside . . . . . *Taranucnus*, Sim.
- B. Posterior row of eyes straight or almost. Femora of first pair of legs only armed with spines. (*Leptyphantés*.)
- i. Femora of first pair alone armed with a spine. Metatarsi of at least the first two pairs bearing a single erect spine on the upperside near the base of the joint (*nebulosus*, *leprosus*, *alacris*, and *minutus* have several lateral spines as well). Falces in both sexes similarly though very slightly attenuated and divergent at the apex . . . . . *Leptyphantés*, Menge, Sim.
- ii. Femora of at least the first two pairs armed with spines. Metatarsi without any spines at all. Falces of males alone slightly attenuated and divergent. *Bathyphantés*, Menge Sim.
- 2\*. Anterior metatarsi shorter than the tibiae.
- A. Eyes small and widely separated.
- i. Sternum produced behind into a long, slender, pointed prominence, extending beyond the coxal joints of the fourth pair of legs, not suddenly curving downwards . . . . . *Opistoxys*, Sim.
- ii. Sternum *terminating* behind and suddenly curving down between the coxal joints of the fourth pair of legs.
- a. Legs long and slender; tibial spines long and stiff. Sternum terminating in a stout, short, conical point. . . . . *Porhomma*, Sim.
- b. Legs short and very stout; tibial spines short and fine. Sternum terminating in a truncate point. *Hilaira*, Sim.
- B. Eyes larger and much nearer together.
- i. Legs short and stout. Eyes of posterior row rarely less than one diameter apart, *usually more*. Prominences on which are situated the lateral eyes scarcely noticeable . . . . . *Tmeticus*, Menge, Sim.
- ii. Legs long and more slender. Eyes of posterior row seldom more than one diameter apart, *usually less*. Lateral eyes situated upon very distinct oblique prominences.

- a. Eyes of posterior row almost equal in size, centrals slightly larger.
1. Falces of males much attenuated towards the apex and very much divergent . . . . . *Microneta*, Menge, Sim.
  2. Falces of males not attenuated or divergent; similar in both sexes . . . . . *Sintula*, Sim.
- b. Eyes of posterior row unequal; centrals very much larger . . . . *Sydera*, Sim.

Genus LEPTYPHANTES, Menge, Simon.

This genus, originally instituted by Herr Menge, has been adopted by M. Simon for the reception of a certain number of spiders which, in company with many other species more or less closely allied, have hitherto been described temporarily for convenience' sake by our English arachnologists under the generic title *Linyphia*.

The species which the learned French arachnologist has thus gathered together seem to form a fairly distinct little group. The close grouping of the eyes, those of the posterior row not being more than one diameter apart, the sternum never longer than broad, and the absence of any spines upon the femora of the second, third, and fourth pairs of legs render them distinct from a certain number of forms otherwise closely allied and very much alike in general appearance, while the presence of at least one erect spine upon the metatarsi will distinguish them readily from another group of very closely allied spiders which M. Simon separates under the generic name *Bathyphantes*.

The different species which are thus conveniently assembled under a distinctive name may be again broadly divided *inter se* by the following character:—*minutus*, Bl., *nebulosus*, Sund., *alacris*, Bl., *leprosus*, Ohl., exhibit several (four or five) spines upon the metatarsi of the first two pairs of legs at least, while the rest, e. g. *cristatus*, Menge, *pallidus*, Cambr., *zebrinus*, Men., *tenebricola*, Wid., &c., have *only one spine* upon the upperside of the metatarsi near the base.

For further characters we must turn to the general colour of the spider, as a rule similar in both sexes, and to the abdominal pattern; but it is often, indeed almost always, necessary to examine very carefully under a strong simple lens or the 1-inch objective of a compound instrument the palpus and organs of the male and the epigynal process of the female, in order to distinguish each sex individually of the various species.

The palpus, in addition to great divergence in the form of the base of the digital joint, presents also great differences in the shape and development of two processes attached to the palpal organs on the outer side. These are in the following descriptions termed respectively the "falciform process" and the "lateral stylum." These processes are usually very distinct in the majority of the Linyphini, but especially so in species of the genera *Leptyphantes*, *Bathyphantes*, *Tmeticus*, and *Microneta*.

The epigynal process of the female is usually an infallible specific character; but in some cases the females of two different species present, if any difference, one that is almost inappreciable, and therefore for practical purposes useless.

A view of the process in profile with a strong simple lens will usually suffice; but often under a good light and a 1-inch objective the form of the apex of the process viewed from above furnishes a very distinctive character.

It is not of course absolutely necessary that the identification of all the species of this or any other obscure genus should depend entirely upon the variation in form of these minute portions of structure; but when all other characters have failed to give a satisfactory and reliable test of specific difference, then this must be the last resort of the determined-to-see-some-difference scientist, and, failing satisfaction here or failing to define a difference which, though somehow or other apparent, can yet neither be described with pen nor delineated with pencil, then the obstinate irreconcilables must surely be regarded as in a transition-stage, and must be left until such time that under the influence of a wholesome self-respect, aided by other kindly external influences, they get rather more advanced, when perhaps some gimlet-eyed seer may be enabled to detect some difference which he can not only feel himself but can also see and describe in such a way that his disciples may be able to feel and perceive as well.

In the italicized portions of the following descriptions will be found as a rule characters which are peculiar to the particular species under consideration. Those defined in the non-italicized letterpress are almost all equally shared by one or more species (sometimes by all) of the genus.

It is necessary, however, to give these also if a thorough and accurate description of a single species be needed.

*Leptyphantes zebrinus*, Menge.  
(Pl. II. fig. I. 1, 2, 3, 4.)

*Linyphia terricola*, Blk.

*Linyphia zebrina*, Cambr. Spid. of Dorset, p. 182.

*Leptyphantes zebrinus*, Sim. Les Arach. de France, p. 319.

Length of male  $1\frac{1}{2}$  line.

*Cephalothorax, legs, and palpi clear orange-yellow.*

*Abdomen bearing a dorsal longitudinal series of black V-shaped bars (the anterior ones broad, the posterior ones fine and more distinct), standing out conspicuously upon a dull white ground, the latter speckled with cretaceous spots.*

*A white, wavy, longitudinal line runs along the lateral area.*

*Often the whole dorsal area is dull white, the bars being barely indicated. Occasionally the prevailing tint is black, when the white V-shaped intervals become more conspicuous.*

*Sternum dark brown, convex, its surface covered with scattered granulations, each bearing an erect black hair.*

*Caput rather prominent, owing to the concavity of the clypeus (vide Pl. II. fig. I. 4).*

*Eyes conspicuously situated upon black spots. Those of the posterior row equal and equidistant (though they do not at first sight appear so). Anterior centrals much smaller than the laterals, separated by less than half the diameter of one of them.*

*Clypeus viewed in profile very concave, higher than the width of the ocular area, bearing a single upcurved bristle immediately beneath the central anterior eyes.*

*Falces attenuated at the apex and very slightly divergent in the male sex. The outer surface is transversely furrowed with a row of deep striations in both sexes.*

*The inner margin has three small teeth.*

*Legs slender; femora of the first pair bearing a single stout spine on the upperside, the others bearing no spines. Genual joints each with one spine. Tibiæ of all four pairs with two erect spines on the upperside, those of the first two pairs having in addition two lateral spines near the apex. Metatarsi of all four pairs bearing one fine bristle near the base on the upperside.*

*Palpus of Male.*—Humeral joint having on the inner side near the base a small spine-bearing tubercle, probably working upon the transverse striæ on the outside of the falces.

*Cubital joint as broad as long, convex above, bearing a single curving bristle near its apex. Radial joint broader in front, bearing a group of fine hairs, having amongst them a single, long, curving bristle. Digital joint with the palpal organs large, orange-red, and rather elongate, exhibiting on the outer side near the base a falciform process curving up from beneath; its apex is bifid, the anterior branch long, strongly kneed, and aculeate at the apex (Pl. II. fig. I. 1, A, B).*

*The lateral stylum curves up from beneath, alongside of the falciform process, taking a somewhat S-shaped form, termina-*

ting in two black sharp points, the lower one being the longest, its apex extending beyond the organs (Pl. II. fig. I. 1, A).

The epigyne of the female is short and conical, bearing at its apex in front a small tongue-like upcurving process. It is more prominent viewed in profile than that of *tenebricola*, but when viewed from above it so much resembles the same structure in the next species that the difference cannot be described, except that at all points that of *zebrinus* is rather more exaggerated (fig. I. 2).

This species, which is very likely to be confounded with the next, although it will be seen on a close examination to be very different from it, is of a bright orange-red colour, the clypeus is higher than the ocular area, the anterior central eyes are smaller and nearer together, the palpal organs form a larger, more elongate mass, the lateral stylum is much more conspicuous and longer, while the falciform process is larger and terminates in a sharp spiniform point.

The spiders are much more brightly coloured than *tenebricola*. The females can be distinguished by the high clypeus and the very small central anterior eyes, which are within half a diameter from each other. The epigyne is more prominent when viewed in profile.

Very abundant in the autumn amongst grass and other herbage in woods, running actively in the warm sunshine.

They are recorded from Dorset, Cumberland, Essex, Hertfordshire, Cambridgeshire, &c.

*Leptyphantès tenebricola*, Wider.

(Pl. II. fig. II. 1, 2, 2 A, 3, 4.)

*Linyphia tenebricola*, Cambr. Spid. of Dorset. p. 185.

*Leptyphantès tenebricola*, Sim. Les Arach. de France, p. 317.

*Linyphia tenuis*, Bl.

Length of male  $1\frac{1}{4}$  line.

Cephalothorax dull brown, tinged with olive-green, the marginal line and striae tinged with darker brown.

Legs pale straw-yellow, sometimes with an orange-red tinge.

Abdomen very variable; markings consist of a central dorsal series of transverse, dark black, V-shaped bars, their free ends being dilated into a small blotch. The anterior shoulders of the abdomen exhibit a short white slash of cretaceous spots, often in the male sex being the only pale markings on the abdomen, the rest black. Often the pale dull-white ground-colour is predominant, and the apices of the V-shaped bars becoming obsolete, the dorsal pattern resolves itself into two longitudinal series of dark spots, these often obsolete except just

above the spinners, the space immediately above the latter organs being black. The lateral area exhibits a more or less well-defined, longitudinal, sinuous white line, often entirely obsolete in the middle. The ventral surface is uniformly black or lighter brown.

*Sternum* dark brown-black, very convex, covered with scattered granulations, each of these bearing an erect black hair.

*Caput* prominent in front; *clypeus* scarcely as wide as the ocular area, very concave, bearing in front immediately below the eyes a single, strong, upcurved bristle (fig. II. 4).

*Eyes* situated upon dark spots; those of posterior row equal in size and equidistant.

*Central anteriors* smaller than the laterals and separated by almost a full diameter from each other (fig. II. 3).

*Falces* three times as long as the clypeus, slightly attenuated and slightly divergent at the apex in the male sex, parallel in the female sex.

The outer surface of the basal joint is in both sexes transversely furrowed with a row of striæ. The upper margin of the fang-groove is furnished with three sharp teeth, the two at the angle being longest.

*Legs* long, not stout, the femora of the first pair bearing one long spine on the upperside, the others bearing none. Genual joints bearing each one spine. Tibiæ of all four pairs bearing two erect spines on the upperside, those of the first two pairs bearing in addition two lateral spines on either side near the apex.

*Palpus of Male*.—Humeral joint bearing on inner side at the base a small spine-bearing tubercle. *Cubital joint* rather longer than broad, convex above, bearing a short sinuous bristle near the apex above. *Radial joint* longer than the cubital, wide in front, bearing a long curved bristle near apex above.

*Digital joint* with the palpal organs forming a small, compact, rounded mass, having on the outer side near the base a falciform process, small, rather abruptly curved upwards, bifid at its termination, one branch being produced into a slender, sinuous, blunt process, not aculeate.

The lateral stylum curves upwards and forwards, terminating in two black points, the lower one being longest, but its apex scarcely reaches the anterior margin of the palpal organs. This process is much smaller and less prominent than in "zebrinus," as indeed is the whole digital joint (fig. II. 1, A, B).

The epigyne of the female is less prominent when viewed in

profile than that of "zebrinus," appearing as a somewhat conical protuberance, bearing at its apex a rounded tongue-like projection (fig. II. 2, 2 A).

Very similar to the last species, but can readily be distinguished if the following points be noted:—

The whole spider in both sexes is of a dull yellow-brown colour where the last species is orange-red, the legs pale yellow. The clypeus is scarcely as high as the ocular area. The anterior central eyes are not much smaller than the laterals and are nearly one diameter apart. The palpus of the male forms a much smaller, black, compact, rounded mass; the falciform process is smaller and its apex is not aculeate; the lateral stylum is not nearly so prominent, nor does its apex extend beyond the palpal organs. Otherwise the spiders look very much alike.

It is a very common species amongst grass and herbage. I have taken it most abundantly in stables, where it spins its slight horizontal web in the angles of the walls.

*Leptyphantes pinicola*, Simon.

(Pl. II. fig. III. 1, 2, 3, 4.)

Length of male 1 line, female  $1\frac{1}{4}$  line.

*Cephalothorax* sepia-brown, darker along the lines of segmentation and round the margin.

*Abdomen* dull black, iridescent in a strong light, having an olive tinge, without any visible pattern or pale markings.

*Legs* reddish straw-yellow, the metatarsal and tarsal joints tinged with brown.

*Sternum* black.

*Caput*, viewed in profile, a little prominent, owing to the concavity of the clypeus.

*Eyes* large, central anteriors much smaller. Those of the posterior row in a slightly curving line, its convexity directed forwards, close together, scarcely one diameter apart. Lateral anteriors larger than central anteriors, the latter almost contiguous and scarcely one diameter from the laterals.

*Legs* slender, not long. Femora of first pair with one or two spines above, the others unarmed. Anterior metatarsi as long as tibiae. Tibial joints of all four pairs of legs bearing five or six long spines, each at least three times as long as the width of the joint. Genual joint with one long spine at the apex. Metatarsi of all four pairs with one erect spine on the basal third of the upperside of the joint.

*Clypeus* as high as the width of the ocular area, very much concave, bearing in front a single upcurved bristle. (Almost identical in form with that of *L. tenebricola*, Wider.)

*Falces* three times as long as the height of the clypeus, slightly convex and slightly divergent at the apex in the male, parallel in the female; bearing on the upper margin of the fang-groove two short, sharp, conspicuous teeth and a third smaller one.

*Labium* with its margin reflexed (as in all the Linyphini).

*Sternum* not very convex, black, granulose, and set with stiff black hairs.

*Palpus of Male* (fig. III. 2, 3, 4).—*Cubital joint* of the male palpus a little longer than broad, convex above, bearing at its apex a single fine bristle.

*Radial joint* as broad at the apex as it is long (in a lateral view), bearing a few short hairs and a single bristle at its apex.

*Digital joint* forming with the semi-inclosed palpal organs a small globular mass.

*Palpal organs* exhibiting on the outer side near the base the usual chitinous falciform process (not abnormally developed in this species), also a long, slender, flattened, spine-like process, originating from below the base of the falciform process, curving upwards, and directed in a straight line forwards, terminating far beyond the apex of the main palpal organs in a sharp strongly curved point, exhibiting on the lower side, rather more than halfway from the base to the apex, a small, sharp, barb-like spine.

The curved apex of this process seems to be aculeate, but under a strong lens it appears ensiform.

This curious and very distinctive process is merely a highly-developed form of the same process (which has been termed in this paper the lateral stylum) exhibited on the palpal organs of several allied species of British spiders, notably *L. zebrina* and *L. tenebricola*. In these two species the two black points of the process, however, scarcely pass beyond the main palpal organs.

*The epigyne* consists of a long, dark, ovipositor-like prominence, projecting downwards at an angle from the ventral surface, bent suddenly (like the spout of a water-pot) near its termination, and squarely truncate at the apex, its outer side being clothed with stiff dark hairs (fig. III. 1).

This exceedingly distinct and satisfactory little spider has no really close ally amongst known British species, *tenebricola* alone approaching it in general form and structure. From that species it may be distinguished at once by the absence of all markings on the abdomen and of course by the form of the palpal organs and of the epigyne.

On the continent are found, however, several very closely

allied species which exhibit the same process on the male palpal organs highly developed, though of a different form.

Four males and one female of this curious little species (which is new to the British list) were taken by myself on Sept. 18, 1890, beneath stones upon the steep sides of the ridge known as the Swirrel edge, close to the summit of Helvellyn. They were apparently plentiful, and forty or fifty could no doubt easily have been secured had I glanced at my captures and perceived their value.

Doubtless careful search will bring to light in these districts some more of the continental species peculiar to the mountain regions.

### Genus TMETICUS, Menge, Simon.

This genus comprises a number of spiders very distinct in general appearance from those of the last genus, or indeed from those of the greater part of the Linyphiini.

They may be recognized by their rather short stout form, by the round, somewhat hirsute abdomen, by their stout legs and the bluffly rounded caput with eyes large and closely grouped.

They approach in general appearance the spiders comprised under M. Simon's group Enoplognathini, but the margin of the labium of these latter is not reflexed as it is in the Linyphiini.

The following species are found in Great Britain:—*T. bicolor*, Bl. (sub *Linyphia*, Blk., and *Neriene*, Cambr.), *T. concinnus*, Thor., *T. sylvaticus*, Bl. (sub *Neriene*), *T. rufus*, Wid., *T. affinis*, Bl. (sub *Neriene*), *T. Huthwaitii*, Cambr. (sub *Neriene*), *T. scopiger*, Grube (*Linyphia rufa*, Cambr.), *T. Warburtonii*, Cambr., *T. arcanus*, Cambr. (sub *Neriene*, Cambr.), *T. prudens*, Cambr. (sub *Neriene*, Cambr.), *T. abnormis*, Bl. (sub *Linyphia*, Bl.), *T. niger*, F. Cambr.

Of these *T. bicolor*, Bl., is by far the commonest, while the others are all more or less rare, found beneath stones or low down amongst herbage in damp situations. The species described below appears to be quite new and forms a fine addition to our spider-fauna.

*Tmeticus niger*, sp. n. (Pl. II. fig. IV. 1, 2, 3, 4, 5, 6.)

Length of male  $1\frac{1}{2}$  line, of female 2 lines.

*Cephalothorax* pale sepia-brown, depth of tint varying in different specimens, the thoracic and cephalic lines of segmentation being picked out with darker brown.

*Abdomen* dull black, clothed with short dark hairs, usually

without pale markings, in some specimens, however, much paler; sometimes exhibiting, as four very small pale dots upon the dorsal area, the normal depressions in the integument which indicate the points of attachment of the dorsal ventral muscles; following these on either side to the spinners are a series of slender, oblique, pale lines.

Legs stout, short, dull yellow-brown, tinged in some specimens with orange.

Sternum pale sepia-brown.

Caput broad and bluffly rounded, considerably raised behind the eyes (fig. IV. 5).

Clypeus higher than the width of the ocular area, quite smooth, devoid of hairs and bristles.

Eyes large, forming a closely situated group, the centrals of both rows being slightly smaller than the laterals. Posterior row slightly curved, its convexity directed backwards. Central posteriors one diameter apart; lateral posteriors each one and a half diameter from its adjacent central.

Anterior row straight; centrals smaller than laterals, very close together, separate one quarter of a diameter. The lateral anteriors each a little more than one diameter from its adjacent central.

The four centrals form a trapezium whose anterior side is much narrower than the posterior.

Lateral eyes of both rows situated upon slightly raised oblique tubercles (fig. IV. 5).

*Falces*.—Basal joint much longer than the height of the clypeus, very stout, convex and slightly divergent at the apex; its outer surface finely striated; *without granulations, denticulations, or inner-frontal teeth*. The upper margin of the fang-groove is armed with five stout sharp teeth, the three centrals being the longest.

*Labium* much hollowed out, so that the upper margin is strongly reflexed.

*Maxille* as broad at the base as long, but longer than the average breadth; the outer margins obliquely rounded.

*Sternum* as broad as long, terminating behind between the coxal joints of the fourth pair of legs in a broad truncate prolongation.

*Legs*.—No spines upon the femora.

*Metatarsi* shorter than the tibiæ and *without spines*.

*Tibiæ* with two erect fine spines on the upperside; *genual joint* with one at its apex on the upperside.

*Palpus of Male*.—*Humeral joint of palpus long, cubital joint without bristles, radial joint much enlarged on the upperside and produced forwards over the base of the digital joint, form-*

ing a large, concave, cup-like cavity. Its apex is depressed and its outer margin is clothed with long black hairs.

The palpal organs exhibit the normal falciform process on the outside at the base, while at the apex are two spur-like apophyses, one stout, black, and sinuous, the other paler and more slender, their points curving across each other. A long circular spine, stout at the base, lies within the concavity of the apex of the digital joint, not easy to see nor of much specific importance (fig. IV. 1, 2).

The epigyne of the female is not prominent nor produced into a tongue-like or ovipositor-like process. Viewed in profile it forms a short, stout, sparsely truncate, conical prominence (fig. IV. 3, 4).

The italicized portion of the above description contains specific characters only.

This species can be distinguished in both sexes from *expertus*, Cambr., *arcanus*, Cambr., *bicolor*, Bl., *concinuus*, Th., *sylvaticus*, Bl., and *prudens*, Cambr., by the absence of femoral spines.

In the male sex, from *rufus*, Wid., and *affinis*, Bl., by the absence of a tooth in front of the basal joint of the falces upon the inner side.

From *scopiger*, Grube, and *Warburtonii*, Cambr., by the absence of the series of stiff spines upon a prominence on the inner side of the radial joint. From *Huthwaitii* by the very much larger digital joint and quite short inconspicuous radial joint of this latter species.

From *abnormis*, Bl., by its much smaller size and by the large concave radial joint above described; *niger*, F. Cambr., is also black in colour, while *abnormis*, Bl., is orange-yellow.

In the female sex, *niger*, F. Cambr., may be distinguished from *scopiger*, Grube, *Warburtonii*, Cambr., *rufus*, Wid., and *abnormis*, Bl., by the much more prominent epigyne in these species. *Huthwaitii*, Cambr., and *affinis*, Bl., are much larger spiders.

This fine spider does not seem to have been described before. Ten specimens were taken by myself on Sept. 18, 1890, beneath loose pieces of stone scattered in abundance upon the summit of Helvellyn. The females were usually found beneath a thin horizontal sheet of webbing stretched across depressions in the soil beneath the stones.

#### Genus MICRONETA, Menge, Simon.

This genus contains several small, slender, elegant, fine-legged, active spiders hitherto placed by English arachnologists in the genus *Neriene*. They exhibit, in common with

several more genera (*vide* Table of Genera), the metatarsi of the first and second pairs of legs shorter than the tibiæ. The eyes are large and near together (closely grouped together).

The genus may be best recognized by the fact that the lateral eyes are placed upon a conspicuous oblique prominence. The caput is not so rounded and bluff as in the genus *Tmeticus*.

The falces of the males are much attenuated and divergent towards the apex and hollowed out on the inner margin, unlike those of *Leptyphantes* and *Bathyphantes*, whose falces are only very slightly divergent and narrowed at the apex. This genus exhibits no metatarsal spines.

*Microneta sublimis*, Cambr., 1875.

(Pl. II. fig. VII. 1, 2, 3, 4, 5.)

*Neviene sublimis*, Cambr. List of Aran. and Phalan. Berwickshire and Northumberland, 1875; Spid. of Dorset. p. 491.

Length of male 1 line, female 1 line.

*Cephalothorax* pale sepia-brown, margined and tinged along the segmentary striae with darker brown, exhibiting a darker spot at the point of convergence of the cephalic striae.

Abdomen short, convex, black, glossy, clothed with fine short pubescence.

Legs pale orange-yellow, femora brighter orange.

Sternum black, not very convex, bearing some short erect hairs.

Caput not prominent (except where the anterior central eyes project over the clypeus), bearing a few curving hairs.

Eyes of the posterior row situated in a slightly curving line, its convexity directed backwards; equidistant, separated by one diameter, the centrals slightly larger than the laterals. Eyes of the anterior row situated in a straight line, the centrals smaller than the laterals, separated from them by one diameter, from each other by half of one of their diameters.

Clypeus barely as high as the width of the ocular area, very slightly concave, bearing a single, short, upcurving bristle just below the eyes.

Falces at least four times as long as the height of the clypeus. Basal joint stout, convex, almost parallel, and not attenuated in the *female*, bearing on the inner angle two sharp teeth and some smaller ones below; in the *male* sex much more convex, very divergent and attenuated, very concave on the inner side towards the apex, bearing at the most prominent point of the angle three small teeth, also a row of fine hairs between these and the apex; furnished also with a single

tooth on either side (above and below) the point of articulation of the fang.

The basal joint is also grooved on its external lateral surface with deep transverse striations, its frontal surface bearing towards the outer margin a few minute setigerous tubercles (fig. VII. 1, 2).

*Legs* short and slender. Femoral dorsal spines absent (one beneath near apex); one genual and two tibial spines; no metatarsal spines. Metatarsi of first two pairs of legs shorter than the tibiæ.

*Palpus of Male.*—*Humeral joint* curved and slightly incrasated towards the apex (exhibiting on the inner side close to the base a small spine-bearing tubercle, apparently connected with and perhaps working upon the transverse striations on the falces).

*Cubital joint* as broad as long, convex above, bearing near its apex, besides a few short hairs, a single stout sinuous bristle.

*Radial joint* about as broad as long, wider in front, and somewhat angular and prominent on the upper anterior margin, bearing only a few short hairs.

*Digital joint* (viewed in profile) very slightly prominent near the base above. *Palpal organs* bearing at the base below on the inner side a short, stout, obtusely conical, squarely truncate prominence, curving inwards (viewed from above). This prominence (viewed in profile) is directed backwards as a stout blunt spur (fig. VII. 3, 4).

*Epigyne of female* appears as a conical obtusely truncate prominence, very broad (broader almost than long), slightly bilobed at the apex, which is furnished with a small, bifid, chitinous tongue, having on either side two concavities.

The form of the epigyne is almost exactly similar to that of *rurestris*, C. K., and I cannot give any character other than the deeper coloration of the cephalothorax and abdomen and the darker red-tinged legs to help to distinguish the two (fig. VII. 5).

The species was first described by the Rev. O. Pickard-Cambridge, in a list of northern spiders published in 1875\*, from a specimen found upon the Cheviot Hills. No specimens have been captured since that time until Sept. 1890, when I myself had the good fortune to discover seven or eight of both sexes beneath stones upon the steep sides of one of the "passes" usually traversed in ascending Mount Helvellyn, in Cumberland. Many more specimens could doubtless have been obtained.

\* "List of Araneidea and Phalangidea," Proc. Berwickshire N. H. Club vol. vii. p. 314.

The above description is taken from these specimens.

Very rarely taken, but probably common in the mountainous districts. It is recorded from the Cheviot Hills and Mount Helvellyn.

This species is remarkably similar to others of the genus found in Britain, namely *rurestris*, C. K., *subtilis*, Cambr., *innotabilis*, Cambr., while it is closely allied to two continental species, *Grouvellei*, Cambr., and *nigripes*, Sim.

The greater part of the species composing this genus are very similar in general appearance, and require very careful examination with a strong glass to determine the identity of members of the male sex, while the females seem to defy differentiation; at least M. Simon has declared that he can in many cases find no reliable characters, and I feel sure that where he has failed I am not likely to succeed. It may be that several of those now regarded as distinct species will have to be lumped together as one, while the variations may be regarded as those of localized races whose characters, though perhaps in process of development, are not yet sufficiently defined to merit the qualification *specific*.

Subjoined is a table which gives some idea of the specific characters of the males of the less obscure species.

- A. Cubital joint of palpus bearing on the upperside at the apex a tuft of long fine hairs. Humeral joint of palpus incrassated towards the apex . . *M. viaria*, Bl.
- B. Cubital joint of palpus bearing only a short sinuous bristle at its apex. Humeral joint not much incrassated towards the apex.
  - I. Clypeus higher than the width of the ocular area.
    - a. Prominence of digital joint at the base on the upperside very large and conical. Base of digital joint truncate on the inner side, not bearing a tubercle . . . . . *M. conigera*, Cambr.
    - b. Prominence of digital joint at the base on the upperside not very large. Digital joint furnished at the base on the inner side with a small, conical, tubercular prominence . . *M. subtilis*, Cambr.
  - II. Clypeus as high or lower than the width of the ocular area.
    - A. Eyes of posterior row equidistant, separated by a distance equal to one of their diameters.
      - 1. Digital joint conical and very prominent on the upperside near the base. Palpal organs exhibiting no conical prominence at the base beneath . . . . . *M. rurestris*, C. K.

2. Digital joint scarcely at all prominent on the upperside near the base. Palpal organs exhibiting at the base on the inner side and beneath a stout, conical, squarely truncate prominence, directed backwards and recurved inwards and upwards ..... *M. sublimis*, Cambr.
- b. Eyes of posterior row not equidistant; the centrals of the row separated from each other by a distance greater than that separating each from the adjacent lateral eye. . . . . [Cambr. *M. innotabilis*,

*Neriene decora*, Cambr., which I have been unable to examine, must be closely allied to *subtilis*, Cambr., while *Neriene mollis*, Cambr., is closely allied to *rurestris*, C. K.

Good opportunities having lately offered themselves of examining a great number of recently captured specimens of the two very closely allied species *Tmeticus bicolor*, Bl., and *Tmeticus concinnus*, Th., I venture to give figures and a short description of those characters which seem to be most serviceable for distinguishing the two.

At first sight the two species appear to be merely extreme varieties in point of size of one species, and it will scarcely be finally settled as to whether the species be physiologically distinct and thus fulfil all the criteria of true species, until it be shown that those described under *concinnus*, Th., either do not pair with, or, if they do, are unfertile with those described under the name *bicolor*, Bl.

There is every variation in the size of the spiders and the position of the eyes, the height of the clypeus, and the spines beneath the tibiæ of the first two pair of legs, peculiarities of structure which form very good distinctive characters if compared in two specimens standing at the extreme opposing ends of the line, yet so variable themselves in intermediate forms as to render it almost impossible to say of many specimens whether we have before us examples of *concinnus*, Th., or *bicolor*, Bl.

One would be inclined to suppose that in cases like these we have before us excellent examples of that stopping-out process of linking characters which is carried on by the various selective influences, whether physiological or environmental, amongst a series of individuals originally of one stock now in process of being broken up into the groups which form what science knows as distinct species.

The characters given below are very variable. The most

constant and reliable seems to be that afforded by the relative position of the eyes and the height of the clypeus.

The two specimens from which the characters are sketched are from the extreme opposite ends of a long series.

*Tmeticus bicolor*, Bl. (Pl. II. fig. V. 1, 2.)

*Neriene bicolor*, Blackw.

*Linyphia bicolor*, Th.

*Linyphia bicolor*, Cambr. Spid. of Dorset, p. 206.

Size much larger.

*Eyes* of posterior row separated by a full diameter from each other.

*Clypeus* higher than the width of the ocular area.

*Tibiæ* of first two pair of legs bearing beneath two rows of from four to seven spines.

*Metatarsi* of third and fourth pair of legs bearing one dorsal and two lateral spines.

*Tmeticus concinnus*, Th. (Pl. II. fig. VI.)

*Linyphia concinnus*, Th.

Size much smaller.

*Eyes* of posterior row separated by only one half the diameter of one of them.

*Clypeus* scarcely as high as the width of the ocular area.

*Tibiæ* of first two pair of legs bearing a double row of from two to four spines.

*Metatarsi* of third and fourth pairs of legs bearing only one spine on the upperside.

*List of Spiders described.*

*Leptyphantes zebrinus*, Menge, p. 74.

*Leptyphantes tenebricola*, Wider., p. 76.

*Leptyphantes pinicola*, Simon, p. 78.

*Tmeticus niger*, F. Cambr., p. 80.

*Tmeticus bicolor*, Bl., p. 87.

*Tmeticus concinnus*, Th., p. 87.

*Microneta sublimis*, Cambr. p. 83.

EXPLANATION OF PLATE II.

Fig. 1. *Leptyphantes zebrinus*, Menge.

1. Profile view of right palpus of the male. A, falciform process; B, lateral stylum.
2. Profile view of epigyne of female.
3. View of the caput, eyes, and clypeus from in front.
4. Profile view of cephalothorax; legs and palpi truncated.

*Fig. II. Leptyphantes tenebricola*, Wider.

1. Profile view of right palpus of the male. A, falciform process; B, lateral stylum.
2. Profile view of epigyne of female. 2 A. View of the apex of the epigyne from above. The letters A, B, C, D indicate the corresponding portions of structure in each view.
3. View of the caput, eyes, and clypeus from in front.
4. Profile view of the cephalothorax; legs and palpi truncated.

*Fig. III. Leptyphantes pinicola*, Simon.

1. Profile view of epigyne of female, exhibiting the basal joints of the third and fourth pair of legs. A, lateral stylum.
2. Profile view of right palpus of male.
- 3, 4. Other views of the lateral stylum.

*Fig. IV. Tmeticus niger*, sp. n.

1. Profile view of right palpus of male, showing characteristic radial joint.
2. Another profile view of radial joint, showing its concave structure.
3. Profile view of epigyne of female.
4. View of the apex of epigyne from above.
5. Caput and eyes from in front.
6. Profile outline of spider, palpi and legs truncated.

*Fig. V. Tmeticus bicolor*, Bl.

1. Caput, eyes, and clypeus from in front.
2. Palpus of male, showing characteristic tuft of bristles upon radial joint.

*Fig. VI. Tmeticus concinnus*, Thor. Caput, eyes, and clypeus from in front.*Fig. VII. Microneta sublimis*, Cambr.

1. Basal joint and fang of male from in front.
2. Basal joint and base of fang; lateral view.
3. Digital, radial, and cubital joints and palpus of male from beneath, showing at A the spur-like apophysis.
4. Profile view of right palpus of male, showing at A the spur-like apophysis.
5. View of epigyne of female from above.

VIII.—*Abstract of some Investigations into the Structure of the Oligochæta.* By FRANK E. BEDDARD, M.A., &c.*Oligochæta intermediate between the Limicolæ and Terricolæ of Claparède.*

CLAPAREDE'S division of the Oligochæta into Oligochæta Limicolæ and Oligochæta Terricolæ ("Recherches Anatomiques sur les Oligochètes," Mém. Soc. Phys. Genève, t. xvi., 1862), though certainly expressing the knowledge of his time when *Lumbricus* was the only terrestrial Annelid whose anatomy was known, has been shown to be no longer tenable. Many of the characters believed to be restricted to the Limicolæ have been discovered in Earthworms. The only